CT screening for lung cancer

We read with interest the recent opinion piece by Field et al.1 outlining plans for a CT screening trial in the United Kingdom (the UK Lung Screen (UKLS)) following the results of the National Lung Cancer Screening Trial. We agree that cost-effectiveness and defining who would most likely benefit from CT screening remain key issues to be resolved before CT screening can be offered routinely in clinical practice.

First, cost-effectiveness is most likely to be achieved through optimising the risk assessment of those potentially eligible for CT screening1 and maximising the number of cancers identified for each scan done. While historical data may assist in this risk assessment,2 it is possible that biomarkers are required to better stratify this risk. In this regard, we and others have shown that a reduced forced expiratory volume in one second (FEV1) is the single most important risk factor (and biomarker) for lung cancer susceptibility and is present in up to 80% of those diagnosed with lung cancer.3 We hypothesise that targeting those smokers with mildly or moderately reduced FEV1 may help maximise picking up of ‘treatable’ lung cancer.4 Such an approach was reported in a small community-based study where lung cancer was detected in 6% of those who underwent baseline CT screening.4 More recently we have shown that by using a risk model that incorporates FEV1, DNA sampling and other biomarkers, we can identify those with a reduced FEV1 who would be most likely to benefit from CT screening.5 We hypothesise that smokers with normal lung function, no evidence of emphysema on baseline CT scan and/or ‘low’ gene-based risk5 might not require yearly scanning.

Such a group might defer scanning (or increase the scanning interval), much like colonoscopy for bowel cancer screening is individualised according to the risk level. Both these hypotheses could be examined in the UKLS where the ‘single screen’ design and DNA sampling enable a gene-based risk model to be examined with respect to predictability and survival (figure 1). We conclude that optimisation of patient selection and scan interval, through biomarker-based risk stratification, may help improve the cost-effectiveness of CT screening.

**Figure 1** Proposed study design to assess cost-effectiveness in the UK Lung Screen using spirometry and gene-based risk stratification to optimise lung cancer detection rate. LLP, Liverpool Lung Project model.6

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